



*LNSB, LLLP  
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*“Specializing in Low Impact Development Technologies Consulting & Education Services”*

## **MEMORANDUM**

**Date: September 19, 2005**

**To: Jon W. Lindgren, Land Acquisitions Manager, Pulte Homes,**

**Re: Metro West; LIDs Annual Maintenance Costs**

The following information was gathered from various sources and represents an estimate of the average annual maintenance costs for the various LIDs to be used for the Metro West development. These costs are only estimates as the actual maintenance cost will be subject to a bid process and market conditions at time of service acquisition. The cost estimates are consistent with the maintenance guidelines established in the SWM / BMP / LID Proffer shown in Exhibit B - Metro West SWM / BMP / LID Maintenance Guidance / Criteria.

### **Green Roof Maintenance**

Included in this cost estimate is the basic cost of routine maintenance of the structural components of the roof and the maintenance of landscape materials for both the Extensive and Intensive green roofs.

Basic routine roof maintenance program \$0.08 / sf / year includes visual inspection of the roof area, flashings, roof drains, and occasional repair. This type of annual maintenance program should support a 20-year service life for flashings and roof drains, and a 40-year service life for the roof membrane.

Extensive Green Roof landscape maintenance by landscaping service company assuming 1-2 visits per year  
\$0.05 - \$0.09 / sf / year.

Intensive Green Roof landscape maintenance by landscaping service company assuming 1-2 visits per year \$0.08  
- \$0.15 / sf / year

Sources of Information: Roofscapes, Inc; Roofspec., Inc.; & American Hydrotech.

### **Porous Pavers**

Routine maintenance consists of vacuum sweeping at least two times per year. Contactors generally charge on a per hour basis which can range from \$75 to \$95 per hour. Sweeping should include the paver areas and all paved surfaces draining to the pavers. It is estimated that the sweeping operation could take as long as 16 hours to complete for a total annual cost of \$2,400 - \$3,040. This assumes two eight 8 hour sweeping operations / year.

Additionally the pavers should be inspected on an annual basis by a registered professional engineer or other qualified professional to ensure structural integrity @ \$1,500. Damage areas will need to be repaired and replaced on an as needed basis.

Sources of information: Cahill Associates, Inc; Masco Sweepers, Inc.; and, California Stormwater Manual.



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### **Filtterra Tree Boxes**

Routine maintenance consists of semi-annual inspections and removal of accumulated trash, debris and sediment, annual removal / replacement of mulch and occasional plant replacement. The first year of maintenance is provided by the manufacturer at no additional cost. Afterward, maintenance can be provided by the manufacturer at \$600 / year / unit or provided by the property owner / manager. If the maintenance is provided by the property owner the annual maintenance cost would be about ½ or \$300 / year / unit. The street sweeping program could further reduce the need for routine cleaning of the tree filters thus reducing the annual maintenance to about \$100 / year / unit by drastically reducing the need for trash / sediment removal. The annual maintenance cost for per unit is estimated at \$100 - \$600 / year.

Source of information: Americast Inc., Filtterra Division

### **Bioretention Basins**

Routine maintenance consists of periodic inspection, plant care and replacement of mulch at least on an annual basis. The maintenance cost can vary greatly depending on the design and type of landscape material used. For example, if the bioretention basin uses a turf cover the cost would be relatively low. If the basin is intensely landscaped with a variety of shrubs and trees maintenance will be much more expensive. It is estimated that range of maintenance costs is \$0.13 to \$0.25 / square foot. The total area of bioretention basins for the project is about 25,100 square feet with a total annual maintenance cost range of \$3,263 to \$5,275.

Sources of information: Low Impact Development Center; City of Morgan Parks & Recs.; and US EPA.